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Magnetic properties of the rivers feeding the South China Sea: a critical step for understanding the paleo-marine records.

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In order to use the magnetic properties of marine sediments as a tracer for past changes in the precipitation rate and in oceanic water masses transport and exchanges, it is critical to identify and to characterize the different sources of the detrital fraction among which the magnetic particles. This is of peculiar importance in marginal seas such as the South China Sea extending from about 25°N to the equator.
Thanks to the Westpac project, we had access to a number of sediments collected in the deltas of the main rivers feeding the South China Sea. This is represented on the Asian continent by the Pearl river, the Red River, the Mekong river, by Malaysia, Sumatra and Borneo regions with minor rivers but also contributing to the South China Sea, and finally by Luzon and Taiwan. The geological formations contributing to the river sediment discharges are different from one catchment basin to another as well as the present climatic conditions.
The magnetic analyses conducted on the samples are the low-field magnetic susceptibility, the ARM acquisition and decay, the IRM acquisition and decay, the back-field acquisition, the thermal demagnetization of 3-axes IRM, the hysteresis parameters, the FORC diagrams. The obtained parameters all together allow us to define the nature of the magnetic grains and their grain size distribution when magnetite is dominant. Some degree of variability is observed at the river mouths, illustrating different geological sources at the local/regional scale. As an average, it appears that the Southern basin of the South China Sea is surrounded by regions richer in high coercivity magnetic minerals than the northern basin. This mineral is identified as hematite while magnetite is more abundant in the north. These results are complementary to the clay mineral assemblages previously determined on the same samples.
We'll give some example of how this knowledge allows us to interpret the paleo-marine records from the South China Sea in terms of paleoclimate and paleoceanographic changes.
This work is presently conducted in the framework of the Franco-Chinese LIA-MONOCL